

# HEPAMINO

*The original  
Proteolysed Liver*

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# HEPAMINO

Trade mark

## THE ORIGINAL PROTEOLYSED LIVER

**Obtained by the controlled digestion of fresh whole  
liver with a suitable enzyme**

**Hepamino, which is rich in amino acids and water soluble  
vitamins, contains all the factors concerned with the control  
of macrocytic anæmias caused by a deficiency of the  
hæmatopoietic principles of liver**

### WHY HEPAMINO WAS DEVELOPED

Although the treatment of pernicious anæmia by the parenteral administration of liver extracts has to a very considerable extent replaced the oral administration of whole liver, it is generally accepted that fractionation of raw liver as generally adopted in the production of liver extracts for injection removes some essential factor or factors necessary for the recovery of all patients.

It was the anomalous results obtained from time to time following the use of highly fractionated extracts in the parenteral treatment of atypical macrocytic anæmia, particularly the nutritional type and of the macrocytic anæmias of sprue and steatorrhœa, that stimulated research into the problem.

This research carried out at THE EVANS BIOLOGICAL INSTITUTE in collaboration with the Department of Medicine of the University of Edinburgh, showed that the factors essential for the treatment of these atypical forms of anæmia were liberated if the raw liver was

first subjected to controlled digestion by a suitable enzyme (proteolysis). As a result of this observation, PROTEOLYSED LIVER, an oral preparation was evolved and subsequently marketed under the trade name of HEPAMINO in 1943.

In the early clinical experiments, HEPAMINO showed unexpectedly great activity in the treatment of cases of classical pernicious anæmia. (Davis, Davidson, Riding and Shaw 1943) <sup>(1)</sup>. More important still, patients with refractory anæmia with megaloblastic arrest of the bone marrow and who were unresponsive to treatment with potent liver extracts administered parenterally, were rapidly restored to normal health. (Davis and Davidson 1944) <sup>(2)</sup>. Davis (1944) <sup>(3)</sup> also recorded two cases of refractory macrocytic anæmia with megaloblastic marrow in children which were completely resistant to parenteral liver extracts but which showed a satisfactory response to HEPAMINO therapy.

The physicians sponsoring these clinical trials concluded that

“PROTEOLYSED LIVER contains in a readily assimilable form, some hæmatopoietic factor additional to the anti-anæmia factor present in fractionated liver extracts.”

During recent years the outstanding value of HEPAMINO in all macrocytic anæmias caused by a deficiency of the anti-anæmic factors of liver, has been confirmed and accepted. A review of the history of this important achievement in the therapy of blood diseases was published by Davidson (1948) <sup>(4)</sup>. This review was part of the symposium on anæmias in a special issue of *Blood*, the Journal of Hematology, to commemorate the 60th birthday of George Minot, a pioneer of liver therapy.

The demonstration that PROTEOLYSED LIVER contains unknown but essential hæmatopoietic factors other than the pernicious anæmia principle, has stimulated research in this country and America to isolate these factors.

HEPAMINO contains folic acid and at one time it seemed possible that this might be the all important factor missing from fractionated liver extracts. Some confirmation of this was secured when Davidson and Girdwood (1946) <sup>(5)</sup> apparently successfully treated refractory macrocytic anæmia with folic acid. In three patients, however, normal red cell and hæmoglobin levels could not be restored by folic acid therapy although these were achieved after the administration of PROTEOLYSED LIVER <sup>(5,6,7)</sup>. At the present time folic acid is chiefly of academic interest particularly since its incrimination in the development of neuropathies in conditions other than pernicious anæmia <sup>(8,9,10)</sup>.

The search for the unknown essential factors continues but meanwhile PROTEOLYSED LIVER (HEPAMINO) remains of outstanding importance in the treatment of macrocytic anæmias caused by a deficiency of the hæmatopoietic factors in liver.

### INDICATIONS

The oral treatment of *all* types of macrocytic anæmia caused by a deficiency of liver factors.

PROTEOLYSED LIVER is the only liver extract at present known for the effective control of macrocytic anæmia of the refractory type.

When a case diagnosed as pernicious anæmia fails to respond in two weeks to the suggested doses of NEO-HEPATEX or other highly

fractionated liver extract, HEPAMINO (PROTEOLYSED LIVER) should be given, and if possible the patient's condition controlled by hæmatological examinations.

Being free from carbohydrates, HEPAMINO may be administered to diabetic patients.

## DOSAGE AND ADMINISTRATION

**Initial Treatment :**  $\frac{1}{2}$  to 1 oz. daily (14 to 28 grammes approx.)

**Maintenance Treatment :**  $\frac{1}{4}$  oz. daily (approx. 7 grammes or 2 level dessertspoonfuls).

Dissolve in hot water, soup, milk or other suitable liquid. Season to taste.

HEPAMINO is a dry, sterile, granular, light brown powder which is slightly hygroscopic. It is manufactured in accordance with the original process covered by British Patent 565986.

## Microbiological Assay

100 grammes HEPAMINO contain :—

|                         |       |       |               |
|-------------------------|-------|-------|---------------|
| Aneurin                 | ..... | ..... | 1 milligramme |
| Riboflavin              | ..... | ..... | 13    "       |
| Pyridoxin               | ..... | ..... | 2       "     |
| Pantothenic acid        | ..... | ..... | 100     "     |
| Folic acid              | ..... | ..... | 3       "     |
| Biotin                  | ..... | ..... | 0.4     "     |
| Inositol                | ..... | ..... | 250     "     |
| Nicotinic acid          | ..... | ..... | 60      "     |
| Vitamin B <sub>12</sub> | ..... | ..... | 0.6     "     |
| Hydrolysed protein      | ..... | ..... | 80 grammes    |

HEPAMINO contains also Vitamins B<sub>10</sub> and B<sub>11</sub>, Purine and Pyrimidine bodies and other unidentified anti-macrocytic anæmia factors.

### Chemical Analysis

|                                   |                 |
|-----------------------------------|-----------------|
| Total Nitrogen .....              | 12.9%           |
| Amino nitrogen .....              | 2.5%            |
| pH of 2% aqueous solution .....   | 5.0—5.5 approx. |
| Water .....                       | 3.3%            |
| Ash .....                         | 5.2%            |
| Iron as parts per million .....   | 230             |
| Copper as parts per million ..... | 40              |

### PRESENTATION

Hermetically sealed Tins of 5 oz.

(140 grammes approx.)

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